Fairness of artificial intelligence in healthcare: review and recommendations

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Abstract

In this review, we address the issue of fairness in the clinical integration of artificial intelligence (AI) in the medical field. As the clinical adoption of deep learning algorithms, a subfield of AI, progresses, concerns have arisen regarding the impact of AI biases and discrimination on patient health. This review aims to provide a comprehensive overview of concerns associated with AI fairness; discuss strategies to mitigate AI biases; and emphasize the need for cooperation among physicians, AI researchers, AI developers, policymakers, and patients to ensure equitable AI integration. First, we define and introduce the concept of fairness in AI applications in healthcare and radiology, emphasizing the benefits and challenges of incorporating AI into clinical practice. Next, we delve into concerns regarding fairness in healthcare, addressing the various causes of biases in AI and potential concerns such as misdiagnosis, unequal access to treatment, and ethical considerations. We then outline strategies for addressing fairness, such as the importance of diverse and representative data and algorithm audits. Additionally, we discuss ethical and legal considerations such as data privacy, responsibility, accountability, transparency, and explainability in AI. Finally, we present the Fairness of Artificial Intelligence Recommendations in healthcare (FAIR) statement to offer best practices. Through these efforts, we aim to provide a foundation for discussing the responsible and equitable implementation and deployment of AI in healthcare.